

WHAT IS CLAIMED IS:

1. An image processing apparatus, comprising:
holding means for holding plural pieces of frame data
obtained from image data input at a plurality of positions;
5 extraction means for extracting frame data determined
to have been captured at substantially a same position from
said plural pieces of frame data held by said holding means;
deletion means for deleting frame data overlapping
another piece of frame data extracted by said extraction
10 means; and
storage means for storing, after associating with a
position on a map, frame data remaining after a deleting
process performed by said deletion means.
- 15 2. The apparatus according to claim 1,
wherein said holding means stores each of the plural
pieces of frame data associated with position data
indicating a position at which each piece of frame data is
captured, and
20 said extraction means extracts frame data matching in
position data.
3. The apparatus according to claim 2,
wherein said position data is obtained based on GPS.
- 25 4. The apparatus according to claim 2,

wherein said image data is captured with a plurality of moving capture devices for capturing different directions, and

said position data is obtained from a distance meter
5 for measuring a moving distance of a moving object which moves with said plurality of capture devices.

5. The apparatus according to claim 2, further comprising: setting means for setting sampling intervals
10 of frame data,

wherein said extraction means extracts a frame data for which a distance obtained by position data is shorter than a distance corresponding to the sampling intervals set by said setting means.

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6. The apparatus according to claim 1,

wherein said holding means stores each of the plural pieces of frame data associated with speed data obtained when each piece of frame data is captured, and

20 said extraction means extracts a frame data group comprising frame data indicating a stop of movement according to the speed data.

7. The apparatus according to claim 1, further comprising
25 determination means for comparing two pieces of frame data and determining whether or not the two pieces of frame data have been captured at a same position,

wherein said extraction means extracts frame data determined by said determination means to have been captured at the same position.

5 8. The apparatus according to claim 7,
wherein said determination means computes least squares error between two pieces of frame data, and determines that the two pieces of frame data match each other when the computed least squares error is equal to or
10 smaller than a predetermined value.

9. The apparatus according to claim 7,
wherein said determination means computes a relative distance between two pieces of frame data based on
15 corresponding points of the two pieces of frame data, and determines that the two pieces of frame data match each other when the computed relative distance is equal to or smaller than a predetermined value.

20 10. The apparatus according to claim 7,
wherein said image data is captured while a plurality of capture devices are moving when capturing images in different directions, and
said frame data adopted by said determination means
25 is obtained by a capture device facing in a direction vertical to a moving direction.

11. The apparatus according to claim 1, further comprising:

setting means for setting sampling intervals of frame data;

5 obtaining means for obtaining a frame data group captured along a line between two points on a map;

computation means for computing a number of pieces of frame data to be existing in the line between the two points based on the distance between the two points and the
10 sampling intervals; and

thinning means for performing a thinning process on the plural pieces of frame data obtained by said obtaining means such that a number of pieces of frame data computed by said computation means can be obtained.

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12. An image processing method, comprising the steps of:

extracting frame data determined to have been captured at substantially a same position obtained from holding means which holds plural pieces of frame data obtained from
20 image data captured by a plurality of capture devices;

deleting frame data overlapping another piece of frame data extracted in an extracting step; and

storing frame data remaining after said deleting step, after associating with a position on a map.

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13. The method according to claim 12,

wherein said holding means stores each of the plural pieces of frame data associated with position data indicating a position at which each piece of frame data is captured, and

5 said extracting step extracts frame data matching in position data.

14. The method according to claim 13,
10 wherein said position data is obtained based on GPS.

15. The method according to claim 13,
 where said image data is captured with a plurality of moving capture devices for capturing different directions, and

15 said position data is obtained from a distance meter for measuring a moving distance of a moving object which moves with said plurality of capture devices.

16. The method according to claim 13, further comprising
20 the step of: setting sampling intervals of frame data,
 wherein said extracting step extracts a frame data for which a distance obtained by position data is shorter than a distance corresponding to the sampling intervals set in said setting step.

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17. The method according to claim 12,

wherein said holding means stores each of the plural pieces of frame data associated with speed data obtained when each piece of frame data is captured, and

said extracting step extracts frame data indicating
5 a stop of movement according to the speed data.

18. The method according to claim 12, further comprising the step of: comparing two pieces of frame data and determining whether or not the two pieces of frame data have
10 been captured at a same position,

wherein said extracting step extracts frame data determined in said determining step to have been captured at the same position.

15 19. The method according to claim 18,

wherein said determining step computes least squares error between two pieces of frame data, and determines that the two pieces of frame data match each other when the computed least squares error is equal to or smaller than
20 a predetermined value.

20. The method according to claim 18,

wherein said determining step computes a relative distance between two pieces of frame data based on
25 corresponding points of the two pieces of frame data, and determines that the two pieces of frame data match each

other when the computed relative distance is equal to or smaller than a predetermined value.

21. The method according to claim 18,

5 wherein said image data is captured while a plurality of capture devices are moving when capturing images in different directions, and

 said frame data adopted by said determination means is obtained by a capture device facing in a direction
10 vertical to a moving direction.

22. The method according to claim 12, further comprising the steps of:

 setting sampling intervals of frame data;
15 obtaining a frame data group captured along a line between two points on a map;

 computing a number of pieces of frame data to be existing in the line between the two points based on the distance between the two points and the sampling intervals;
20 and

 performing a thinning process on a frame data group obtained in said obtaining step such that a number of pieces of frame data computed in said computing step can be obtained.

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23. A computer-executable program, comprising:

a code of an extracting step of extracting frame data determined to have been captured at substantially a same position obtained from holding means which holds plural pieces of frame data obtained from image data captured by
5 a plurality of capture devices;

a code of a deleting step of deleting frame data overlapping another piece of frame data extracted in an extracting step; and

a code of a storing step of storing, after associating
10 with a position on a map, frame data remaining after said deleting step.

24. A storage medium storing a computer-executable program, wherein said program comprises:

15 a code of an extracting step of extracting frame data determined to have been captured at substantially a same position obtained from holding means which holds plural pieces of frame data obtained from image data captured by a plurality of capture devices;

20 a code of a deleting step of deleting frame data overlapping another piece of frame data extracted in an extracting step; and

a code of a storing step of storing, after associating with a position on a map, frame data remaining after said
25 deleting step.